

UNITED STATES DEPARTMENT OF AGRICULTURE  
Rural Utilities Service  
Technical Standards Committee "A"

Supplement No. 2, January 2003, to  
RUS Informational Publication 202-1,  
List of Materials Acceptable for Use on  
Systems of RUS Electrification Borrowers

The attached pages dated October 2002, for the "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of October through December, 2002. They replace pages dated July 2002 and October 2002. The following changes should be made in order to keep RUS Informational Publication 202-1 up to date.

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U gc-1:U gk-1	U gc-1:U gk-1
U hf(3) Cond.:U hj-1	U hf(3) Cond.:U hj-1
U hv(1) Cond.:U hv(2) Cond.	U hv(1) Cond.:U hv(2) Cond.
U hw-1:U hx-1	U hw-1:U hx-1

b - Pin, pole top, steel

DISTRIBUTION

	12.5/7.2 or 13.2/7.62 kV	24.9/14.4 kV
Pin length, inches:	20	20
Thread diameter, inches:	1	1-3/8
Hole spacing, inches:	8	8
RUS Specification:	D-3	DT-3
Dixie	D-2172-R	D2195-R
Hubbell (Chance)	2199	2195
Joslyn	J740	J720
Kortick	-	K8086
MacLean (Continental)	U36606F-REA	U36652

Pins listed below have 4-1/2" offset which eliminates the use of Item cs

Hubbell (Chance)	C206-0271
Joslyn	J25179
MacLean (Continental)	U36549

TRANSMISSION

Pin Length, inches:	24
Thread diameter, inches:	1-3/8
Hole spacing, inches:	8
RUS Specification:	DT-3
Hubbell (Chance)	2196
Kortick	K8087
MacLean (Continental)	U36653F

NOTE

1. Flared type pins may be mounted with either side against the pole.

Conditional List  
b(1)  
January 2003

b - Pin, pole-top  
(Non-lead threads)

Manufacturer	Conditions
Hubbell Power Systems 2199P (1" threads)	To obtain experience.
Hughes Brothers 2770-A20-100 (1" threads) 2770-A20-130 (1-3/8" threads)	To obtain experience.
Joslyn J740Z (1" threads) J720Z (1-3/8" threads)	To obtain experience.

b - Pin, Fiber-reinforced plastic pole top

Manufacturer	Conditions
Joslyn 7581-624NT (1" threads)* 7581-624XNT (1-3/8" threads)* * Add suffix LT (less tabs) if for steel pole.	To obtain experience.

c - Bolt, machine

Applicable Specification: ANSI C135.1, "Standards for Galvanized Steel Bolts and Nuts" except that the lengths are in the ranges given below.

Applicable Sizes:                      1/2 inch diameter, 6 through 10 inch length  
   5/8 inch diameter, 6 through 24 inch length  
   3/4 inch diameter, 6 through 26 inch length  
   7/8 inch diameter, 6 through 28 inch length

The following manufacturers have shown compliance with the applicable specifications for machine bolts:

Dixie Electrical Manufacturing Company  
Hubbell (Chance)  
Hughes Brothers  
\* Joslyn Manufacturing Company  
Kortick Manufacturing Company  
MacLean (Continental)  
\* Portland Bolt & Manufacturing Company  
The Rockford Bolt & Steel Company  
Steel City Bolt & Screw Co., Inc.

\*"Static proof" design available.

d - Washers, Flat

Flat Rolled Steel

Size, inches:	2-1/4 x 2-1/4	3 x 3	4 x 4	4 x 4	1-3/8 round	1-3/4 round
Thickness, in.:	3/16	1/4	3/16	1/2	12 gauge	10 gauge
Hole Diam., in.:	13/16	13/16	13/16	13/16	9/16	11/16
C & C Spacer	4	-	-	-	-	-
Dixie	D6814	D6817	D6818	D6819-1/2	D6803	-
FWC	FW1076	-	FW1080	-	FW1086	FW1088
Hubbell (Chance)	6814	6817	6818	6819-1/2	6803	6805
Hughes	SW2-1/4-70-3/16	SW3-70	SW4-70	SW4-70(1/2)	RW1-3/8-50	-
Joslyn	J1076	J1079	J1080	-	J1086	J1088
Kortick	K1553	K1555	K1557	K1559-1/2	K1524	K1525
Line Hardware	SWF-225B	SWF-300B	SWF-400A	-	-	-
MacLean (Continental)	U5485	U5487A	U5488	U5490A	U5478	U5479
Wrought Washer	011206	-	-	-	-	-

Flat Cast

Size, inches:	3 x 3
Thickness, in.:	1/4
Hole Diam., in.:	13/16
Hubbell (Chance) (N)	BB214
Joslyn (Flagg) (N)	P56A

Spurred - 3" Round, 3/16" Thick, 13/16" Hole

MacLean (Continental)	TCSF-30-6
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(A) Aluminum Alloy  
(M) Malleable Iron  
(N) Nodular Iron

Washers, Curved

Curved Cast

Size, inches:	2-1/4 x 2-1/4	3 x 3	3 x 4	4 x 4
Thickness, in.:	1/4	5/16	7/16	1/2
Hole Diam., in.:	11/16	11/16	15/16	13/16
Hubbell (Chance) (N)	GCW1A	GCW31	CRW4A	GCW41
Joslyn (Flagg) (M)	P141	P143	P120	P144
Line Hardware (M)	-	CW 33-5	CW 34-7	CW 44-6
MacLean (Bethea)	-	WC-33-5	WC-34-7	WC-44-6
MacLean (Continental)	-	CW-33-5	CW-34-7	CW-44-6
Universal Electric (A)	UW-225	UW-335	UW-347	UW-446

(A) Aluminum Alloy  
(M) Malleable Iron  
(N) Nodular Iron

Curved Rolled Steel

Sizes, inches:	3 x 3	4 x 4(1)
Thickness, in.:	5/16	1/4
Hole Diam., in.:	11/16	15/16
Joslyn (Steel)	-	J6829

(1) To be used only on transmission systems.

f - Pin, crossarm  
(With square washer, nut and MF locknut)

DISTRIBUTION

Thread (inches diam.)	1	1-3/8	1	1-3/8
Length above base (in.)	5	7	5	7
Length below base (in.)	5-3/4	7	1-1/2	1-3/4
Shank (inches diam.)	5/8	5/8	5/8	3/4

	<u>Long Shank</u>		<u>Short Shank</u>	
Dixie	D881	-	-	-
Hubbell (Chance)	881	4717	886	-
Joslyn	J203	J647	J221	J630
Kortick	K7104	K7611	K7122	K7631
MacLean (Continental)	U558	U3137A	U579	U3142

Clamp Type Pin

Thread (inches diam.)	1	1-3/8
Length above base (in.)	5-3/4	7
Dixie	D3322	D3324
Hubbell (Chance)	14322	14322-1
Joslyn	J3322	J3324

Washer Plate for Clamp Type Pin

These plates are equipped with lugs to prevent slippage of pin along crossarm. They may be used to replace the bottom plate on pins already installed.

Hubbell (Chance)	450091
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\*"Static proof" designs available.



f - Pin, crossarm  
(With square washer, nut and locknut)

TRANSMISSION

Thread (inches diameter)	1-3/8	1-3/8
Length above base (inches)	10	10
Length below base (inches)	7	1-3/4
Shank (inches diameter)	3/4	3/4
	<u>Long Shank</u>	<u>Short Shank</u>
Hubbell (Chance)	4332	-
Joslyn	J610	J633
Kortick	K7643	K7635
MacLean (Continental)	U3140	U3145

Conditional List

f(1)

July 2002

f - Pin, crossarm  
(Non-lead threads)  
(With square washer, nut and MF locknut)

Manufacturer	Conditions
<u>Hubbell</u>	
881P - 1" thread, 5 3/4" shank	To obtain experience
886P - 1" thread, 1 1/2" shank	
<u>Hughes Brothers</u>	
2775-A5-3/4, 1" thread, 5-3/4" shank	To obtain experience.
<u>Joslyn</u>	
J203Z, 1" thread, 5-3/4" shank	To obtain experience.
J221Z, 1" thread, 1-1/2" shank	
J647Z, 1-3/8" thread, 7" shank	
J630Z, 1-3/8" thread, 1-3/4" shank	

g - Crossarms, fiberglass

<u>Manufacturer</u>	<u>Description</u>	<u>Conditions</u>
<u>Geotek (PUP)</u>		
<u>Braced Application</u>		
T2000-96-03X	8' Type-3 Drill Pattern	To obtain experience
T2000-96-04X	8' Type-4 Drill Pattern	
T2000-120-05X	10' Type-5 Drill Pattern	
T3000-96-03X	8' Type-3 Drill Pattern	
T3000-96-04X	8' Type-4 Drill Pattern	
T3000-120-05X	10' Type-5 Drill Pattern	
(X = color code)		
<u>Braceless (Centermount) Application</u>		
TB2000-96-03X	8' Type-3 Drill Pattern	To obtain experience
TB2000-96-04X	8' Type-4 Drill Pattern	
TB2000-120-05X	10' Type-5 Drill Pattern	
TB3000-96-03X	8' Type-3 Drill Pattern	
TB3000-96-04X	8' Type-4 Drill Pattern	
TB3000-120-05X	10' Type-5 Drill Pattern	
(X = color code)		
<u>MacLean Power Systems</u>		
<u>Braced Application</u>		
PX08REA003	8' Type-3 Drill Pattern	To obtain experience
PX08REA004	8' Type-4 Drill Pattern	
PX10REA005	10' Type-5 Drill Pattern	
<u>Braceless (Centermount) Application</u>		
PX08ST003	8' Type-3 Drill Pattern	To obtain experience
PX08ST004	8' Type-4 Drill Pattern	
PX10ST005	10' Type-5 Drill Pattern	
<u>Shakespeare</u>		
LSC-REA-03-(X)**	8' Type-3 Drill Pattern	To obtain experience
LSC-REA-04-(X)**	8' Type-4 Drill Pattern	
LSC-REA-05-(X)**	10' Type-5 Drill Pattern	
(**X=2-gray color or 5-dark bronze color)		

h - Brace, crossarm, steel

Wherever item "h" is shown on a construction drawing, use a brace from page cu.

i - Bolt, carriage

Applicable Specification: ANSI C135.1, "Standard for Galvanized Steel Bolts and Nuts."

Applicable Sizes:                      3/8 inch diameter, 3 through 6 inch length  
   1/2 inch diameter, 3 through 6 inch length

The following manufacturers have shown compliance with the applicable specifications for carriage bolts.

Dixie Electrical Manufacturing Company  
Hubbell (Chance)  
Hughes Brothers  
Joslyn Manufacturing Company  
Kortick Manufacturing Company  
MacLean (Continental)  
The Rockford Bolt & Steel Company

j - Screw, lag

Applicable Specifications: ANSI C135.3 "Standard for Zinc Coated Ferrous Lag Screws"

Applicable Sizes:

- 1/2 inch diameter, 4 inch length
- 1/2 inch diameter, 5 inch length
- 5/8 inch diameter, 4 inch length
- 5/8 inch diameter, 5 inch length

The following manufacturers have shown compliance with the applicable specifications for lag screws:

Dixie Electrical Manufacturing Company  
Hubbell (Chance)  
Joslyn Manufacturing Company  
Kortick Manufacturing Company  
MacLean (Continental)

k - Insulators, suspension

ANSI Class Type	52-9A Clevis	52-1 Clevis	52-4 Clevis	52-3 Ball & Socket
Disc Diameter	4-1/4"	6"	9" or 9-1/2"	9" or 9-1/2"
M & E Rating, lbs.	10,000	10000	15,000	15,000
Leakage	6-3/4"	7"	11-1/2"	11-1/2"
Flashover, kV: Dry	60	60	80	80
Flashover, kV: Wet	30	30	50	50
NOTES	(3) (4)	(3) (4)	(5)	(2)

Manufacturer	Catalog Number			
Lapp	-	-	9100	9000
Locke	16044	16583	15S410	15S409
Porcelain Prod. (Knox)	84300	86012	-	-
Sediver	CT-4R2-M	-	-	-
Victor Insulators, Inc.	817	804	-	-

ANSI Class Type	52-3 Ball & Socket	52-4 Clevis	52-5 Ball & Socket	52-6 Clevis
Disc Diameter	10"	10"	10"	10"
M & E Rating, lbs.	15,000	15,000	25,000	25,000
Leakage	11-1/2"	11-1/2"	11"	11"
Flashover, kV: Dry	80	80	80	80
Flashover, kV: Wet	50	50	50	50
NOTES	(2)	(1)	(2)	-

Manufacturer	Catalog Number			
GEC Alsthom	-	105452	-	-
Lapp	8200	8100	301425	2300
Locke	-	20S580	-	30S257
Porcelain Prod. (Knox)	81022	81012	-	-
Sediver	-	CT-8R2	-	-

Notes:

- (1) Use two for 24.9/14.4 kV deadends.
- (2) To be used only on transmission lines.
- (3) To be used only on distribution lines.
- (4) Use two insulators for 12.5/7.2 kV deadends and three for 24.9/14.4 kV deadends.
- (5) Use two insulators for 24.9/14.4 kV deadends.

m - Clamp, Suspension

ANGLE - DISTRIBUTION  
No. 2 & 4 ACSR  
Plus Rods

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2300  
AAC-301 & 302  
-  
GD-907A  
306092  
AC-60  
RALS-1

ABB  
MacLean (Continental)  
Hubbell (Anderson)  
Hubbell (Chance)  
Hubbell (Fargo)  
Lapp  
Line Hardware  
MacLean (Bethea)

2-BOLT TRANSMISSION  
For 3/8" Steel Overhead  
Ground Wire

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6240  
FSC-46N  
MS-46-N  
FGW1  
-  
305740N  
-

n - Bolt, double arming

Applicable Specification: ANSI C135.1, "Standard for Galvanized Steel Bolts and Nuts."

Applicable Sizes: 5/8 inch diameter, 12 inch through 24 inch length

3/4 inch diameter, 20 inch through 24 inch length

The following manufacturers have shown compliance with the applicable specifications for double arming bolts:

Dixie Electrical Manufacturing Company  
Hubbell (Chance)  
Hughes Brothers  
\* Joslyn Manufacturing Company  
Kortick Manufacturing Company  
MacLean (Continental)  
Portland Bolt & Manufacturing Company  
Steel City Bolt & Screw Co., Inc.

\*"Static proof" designs available.



o - Bolt, eye, oval

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes: 5/8 inch diameter, 6 through 20 inch length

3/4 inch diameter, 8 through 20 inch length

The following manufacturers have shown compliance with the applicable specifications for oval eye bolts:

Berny's Forging Company  
Dixie Electrical Manufacturing Company  
Hubbell (Chance)  
\* Joslyn Manufacturing Company  
Kortick Manufacturing Company  
MacLean (Continental)

\*"Static proof" designs available.

Shoulder Eye Bolt  
for Transmission Structures

3/4 inch diameter, 8 inch through 20 inch length

	<u>Catalog Number</u>
Joslyn	J9528 to J9540
Kortick	K9558 to K2570

p - Connectors, distribution (Parallel Groove)

Applicable Specification: ANSI C119.4

ACSR to ACSR  
To same size or smaller

Bare Conductor

	<u>4/0 - 2/0</u>	<u>1/0</u>	<u>2</u>	<u>4</u>
Alcoa	-	396.6	490.0	490.0
Blackburn	PAE 4141-9	PAE 2121-9	PAE 2121-9	PAE 2121-9
Burndy	KVS28A	UCG25R	UC25R2R	UC25R2R
Connector Mfg.	APC-2/0	APC-2/0	APC-1/0	APC-1/0
Hubbell (Fargo)	GA-9040L	GA-9020L	GA-9002L	GA-9003L
Hubbell (Anderson)	LC-53A	LC-51C	LC-51A	LC-51A
Penn-Union	PCAA-20BF	PCAA-15BF	PCAA-10BF	PCAA-10BF
MacLean (Reliable)	APG-3	APG-2	APG-1	APG-1

Over Armor Rods

	<u>3/0</u>	<u>2/0</u>	<u>1/0</u>	<u>2</u>	<u>4</u>
Blackburn	-	-	PAA10	PAA10	PAA10
Burndy	-	-	UC32R	UC32R	UC32R
Hubbell (Anderson)	LC-83A	LC-52C	LC-52C	LC-52C	LC-52C
Hubbell (Fargo)	GA-9843	GA-9842	GA-9041L	GA-9020L	GA-9020L
Penn-Union	-	-	ARC-12	ARC-11	ARC-14
MacLean (Reliable)	-	-	744AL	600AL	600AL

## p - Connectors

Manufacturer	Conditions
<u>Blackburn</u>	
Bolted, insulated	1. For use on 600 volt maximum insulated conductors.
IPC 1102 (#2-1/0 run, #2 tap)	2. To be used only for connecting service drop conductors to service entrance conductors.
IPC 4111 (1/0-4/0 run, #2-1/0 tap)	3. To obtain experience.
IPC 4141 (1/0-4/0 run, 1/0-4/0 tap)	
<u>Homac</u>	
*Compression, Insulated	To obtain experience.
"Shure Splicers"	
Types Q1N and U1N	
<u>Hubbell (Anderson)</u>	
*Compression al to al	To obtain experience.
al to cu "Versa-Crimp" L tap.	
Parallel groove, aluminum	To obtain experience.
LC-52C (1/0 - 6/1 ACSR over armor rods)	
LC-51C (1/0 - 6/1 ACSR)	
<u>Kupler</u>	
Bolted, insulated	1. For use on 600 volt maximum insulated conductors.
130001 (#2-1/0 run, #2 tap)	2. To be used only for connecting service drop conductors to service entrance conductors.
130003 (1/0-4/0 run, #2-1/0 tap)	3. To obtain experience.
130004 (1/0-4/0 run, 1/0-4/0 tap)	
<u>Penn Union</u>	
*Compression, Insulated	To obtain experience.
Type PIK	
<u>Utilco</u>	
Two bolt style, al to al	To obtain experience.
Type PM	

\*NOTE: These connectors are acceptable when installed with tools and dies in accordance with the connector manufacturer's recommendations.

q - Bolt, double upset

Applicable Specification: "RUS Specifications for Single and Double Upset Spool Bolts," D-5

Diameter, inches Length, inches	<u>5/8 7</u>	<u>5/8 8</u>	<u>5/8 9</u>	<u>5/8 10</u>
Dixie	D7824	D7826	D7828	D7830
Hubbell (Chance)	-	7826	7828	7830
Joslyn	-	J2394	J2395	J2396
Kortick	K4760	K4761	K4762	K4763
MacLean (Continental)	U31065	U31067	U31069	U31071

\*Static proof" designs available.

s - Clevis, secondary swinging

Applicable Specifications: "RUS Specifications for Secondary Swinging Clevises," D-6

Manufacturer	Clevis only*	Clevis with 1-3/4" groove spool	Clevis with 3" groove spool
Dixie	D0352	-	-
Hubbell (Chance)	0352	0352-C909-1032	0352-C909-1034
Joslyn	J0322	-	-
Kortick	K9259	K9109	K9149
MacLean (Continental)	U32043	U36043	U32143

\*Catalog Number does not include spool. See page cm for spool type insulators.

u - Deadend for galvanized steel or  
aluminum-clad steel guy strand

3-Bolt Guy Clamp

	<u>Light (1/2" bolts)</u>	<u>Heavy (5/8" bolts)*</u>
Dixie	D6450	D6461
Hubbell (Chance)	6450	6461
Joslyn	J930	J931
Kortick	K4124	K4005
MacLean (Continental)	U5273	U5275

U-Bolt Guy Clamp

	<u>Light (3/8" bolts)</u>	<u>Heavy (1/2" bolts)</u>
Hubbell (Chance)	GCU38C	-
Joslyn (Flagg)	PAX-64C	PAX-67C
MacLean (Continental)	GC-64C	GC-67C

Offset Guy Clamp

	<u>Light (1/2" bolts)</u>	<u>Heavy (5/8" bolts)</u>
Hubbell (Chance)	6409	6410
Joslyn	J926	J927

\*For use on transmission.

v - Guy Attachment  
for 5/8" bolt

Type:	Formed Strap	Angle Bolt Eye	Guy Hook	Guy Hook*
Maximum Working Load Rating	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	37,800 N (8500 lbs.)
Dixie	D5004	D0100	DD-9460	DD-9462
Hubbell (Chance)	5004	0100	-	GH5
Joslyn	J25164	J6500	J6555 J6556	-
Joslyn (Flagg)	-	-	-	P151X
Kortick	K4035 K4047	K3140	-	-
Line Hardware	-	-	-	HGA-58C
MacLean (Bethea)	-	-	-	AG-5
MacLean (Continental)	U31030	U5531	GAD	GAD-56-4
Power Play Products	-	-	-	B58GH
Universal Electric	-	-	-	UGA-56C

\*This hook may be used in place of the wrapped guy arrangement in assemblies E3-2 and E3-3.

Pole Eye Plates  
(5/8" Bolt)

Type	Pole Eye Plate
Maximum Working Load Rating	37,800 N. (8500 lbs.)
Joslyn (Flagg)	PX88
Hubbell (Anderson)	GSP-05
Line Hardware	PGA-548
MacLean (Bethea)	PE5-6A
MacLean (Continental)	PEP-66-45



x - Rod, anchor

Applicable Specification: ANSI C135.2, "Standards for Galvanized Ferrous Strand Eye Anchor Rods."

Applicable Sizes:

- Single guy: 5/8 inch diam. 6, 7 and 8 feet long  
3/4 inch diam. 8, 9 and 10 feet long  
1 inch diam. 9 and 10 feet long
- Double guy: 5/8 inch diam. 7 and 8 feet long  
3/4 inch diam. 8, 9 and 10 feet long  
1 inch diam. 9 and 10 feet long
- Single Guy Drive: 5/8 inch diam. 7 and 8 feet long  
3/4 inch diam. 8, 9 and 10 feet long  
1 inch diam. 9 and 10 feet long
- Double Guy Drive: 5/8 inch diam. 7 and 8 feet long  
3/4 inch diam. 8, 9 and 10 feet long  
1 inch diam. 9 and 10 feet long

The following manufacturers have shown compliance with the applicable specifications. Some manufacturers cannot supply all sizes listed above. Check with manufacturer or distributor for availability.

Dixie  
Eritech (Carolina Galvanizing/Knight)  
Hubbell (Chance)  
Joslyn  
Kortick  
Utilities Service  
Grip-Tite

Conditional List

x(1)

July 2002

x - Rod, anchor

Applicable Specification: ANSI C135.2 "Standards for Galvanized Ferrous Strand Eye Anchor Rods" except rods are copper covered. Copper coating thickness is 13 mil minimum at any point and a 15 mil average. All purchases should specify that a factory certification to the thickness of the copper must accompany the shipment of the rods.

Applicable Sizes: Double Guy - 3/4 inch diameter, 8 and 9 feet long.

Manufacturer	Conditions
Joslyn	<ol style="list-style-type: none"><li>1. To obtain experience.</li><li>2. For transmission purposes only.</li><li>3. For use with log anchors or copper covered plate anchors only.</li><li>4. To be used with copper coated hardware or bronze hardware underground.</li></ol>

z - Anchors, Expanding and Plate

DISTRIBUTION

Designated Maximum holding power-lbs.		6,000	8,000	10,000	12,000
Min. Area (sq. in.)		90	100	120	135
Rod Dia. (inches)		5/8	5/8	3/4	3/4
Rod Length (feet)		7	7	8	-
	<u>Type</u>				
Dixie	4 way Plate	D88100-G -	D88115-G D7502-G	D88135-G -	D88135-G D7504-G
Grip-Tite	8 way	A322812G	A322812G	A322812G	A322812G
Hubbell (Chance)	8 way	88135	88135	88135	88135
Joslyn	8 way	-	J8115	J8135	J8135
Line Hardware	8 way	8-100G	8-115G	8-135G	8-135G
MacLean (Continental)	8 way Plate	UC88100-G -	UC88115-G UC617-G	UC88135-G UC622-G	UC88135-G UC822-G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, plate

Applicable Specification: "RUS Specification for Steel Plate Anchors," T-3

TRANSMISSION

Minimum Area 400 sq. in.

	<u>3/4" Galv. Rods</u>
<u>Grip-Tite</u>	XP24 - 3/4 - G
<u>Hubbell (Chance)</u>	X24 - 3/4
<u>Joslyn</u>	J3524 - 3/4
<u>Line Hardware</u>	CP-24G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, Service

Designated Maximum Holding Power in Sand - 2500 lbs.

	<u>Screw</u>	<u>Expanding</u>
Dixie	D-6526	-
Eritech (Carolina Galvanizing)	86346606	-
Grip-Tite	-	322065G
Hubbell (Chance)	6346	6870
Joslyn	J6526W-CA	JO870
Line Hardware	-	8-70G
MacLean (Continental)	UC6346-G	UPL62-2.5-G

z - Anchors, Swamp

DISTRIBUTION

	<u>10" dia.</u>	<u>12" dia.</u>	<u>15" dia.</u>
Dixie	D-6710-S	D-6713-S	D-6715-S
Foresight	-	MR-SR*	-
Hubbell (Chance)	10150AS	132AS	152AS
MacLean (Continental)	UC10150A-G	UC122A-G	UC152A-G

\*Drive type anchor. Surface area meets or exceeds that of 12" diameter anchors.

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, Rock

	Expanding Rock Anchors			Rock Guy Bolt
Anchor Size - inches	1-3/4	1-3/4	1-3/4	1-3/4
Rod Length - inches	15	30	53	18
Rod Diameter - inches	3/4	3/4	3/4	1
Hubbell (Chance)	R315	R330	R353	-
Joslyn	J3436	J3437	J3438	-
Kortick	K5503	K5504	K5505	K2377
MacLean (Continental)	UCR315	UCR330	UCR353	U5003

z - Pole keys

Hubbell (Chance)	P-4817
Joslyn	J-4817
MacLean (Continental)	UCP-4817

## z - Anchors

Manufacturer	Conditions
<u>Bathurst</u> Screw anchors, power installed BMS-003 (6,000 lbs.) BMS-003R (5/8" rod) BMS-004 (10,000 lbs.) BMS-004R (3/4" rod)	To obtain experience.
<u>Dixie</u> Screw anchors, power installed D-1162-G (6,000 & 8,000 lb., 5/8" rod) D-1375-G (10,000 & 12,000 lb., 3/4" rod)	To obtain experience.
<u>Foresight</u> MR-1, MR-2, MR-3, MR-4	1. To obtain experience. 2. Each installation must be proof tested. Maximum rating is test value achieved.
<u>Hubbell (Chance)</u> Screw anchors, power installed 024462 (6,000 and 8,000 lb.) 12332P (5/8" rod) 12587 (5/8" thimbleye nut) 024484 (10,000 and 12,000 lb.) 12632P (3/4" rod) 6512 (3/4" thimbleye nut)	To obtain experience.
<u>Joslyn</u> Screw anchors, power- installed J1IB-CA (6,000 & 8,000 lb., 5/8" rod) J13C-CA (10,000 & 12,000 lb., 3/4" rod)	To obtain experience.

NOTES: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

Catalog numbers shown for screw anchors are for anchors with 1-3/8" hubs. Equivalent anchors with 1-1/2" hubs are also acceptable. (A special installing wrench is required.)

aa, ab  
January 2003

aa - Nut, eye  
ab - Nut, thimble eye

	aa		ab	
	Eye Nut Conventional		Eye Nut Eyelet	Thimble Eye Nut
	5/8"	3/4"	5/8"	5/8"
Berny's Forging Co.	OE1	-	-	-
Dixie	D6502	-	DD-6517	D6510
Hubbell (Chance)	6502	-	B14A	6510
Hughes	EN60	-	-	-
Joslyn	J1092	J1093	J1126	J6510
Kortick	K4212	-	K4413	K3111
Line Hardware	OEN-58	-	BEL-58	-
MacLean (Continental)	EN-5	-	BE-5	TN-5



ac - Brace, sidearm diagonal

	1-1/2 inch angle 3/16" x 5'	1-3/4 inch angle 3/16" x 7'
Hubbell (Chance)	-	6984
Joslyn	-	J1525
Kortick	K1951	K1954
MacLean (Continental)	U5210	U5212

ae - Surge (lightning) Arrester, Distribution Class

SiC Type

Manufacturer	Type	Ratings, kV	Housing	Duty
ABB	LV	9/10	Porcelain	Normal
	LVBB	9/10, 18	Porcelain	Heavy
General Electric	Alugard	9, 10, 18	Porcelain	Heavy
Kearney/Cooper Power Systems	Unigap	9, 10, 18	Porcelain	Heavy

MOV Type

Manufacturer	Type	Ratings, kV	Housing	Duty
Cooper Power Systems	AZL VariSTAR	9, 10, 18, 27	Porcelain	Heavy

ai - Rods, Ground

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Hot Dip Galvanized Steel

Manufacturer	5/8"	3/4"
Blackburn	-	GR7508
Boggs	G588	G348
	PTG588**	PTG348**
Dixie	D8578	D8618
Erico	G588	G348
	G588PT**	G348PT**
Eritech (Carolina Galvanizing/Knight)	815880	813480
	815889**	813489**
Galvan	GR6258	GR7508
	GR6258P**	GR7508P**
General Electric	0982-00002	0982-00003
Grip-Tite	GT588	GT348
Hubbell (Chance)	8578	8618
	C203-0107**	C203-0109**
	C203-0377*	-
	GT588PT**	GT348PT**
Joslyn	J5328	J5338
Korns	KG58	KG34
Kortick	K4658	K4678
Line Hardware	GR-588G	GR-348G
Lloyd	6258H	7508H
MacLean (Continental)	U5307	U6338
Porcelain Products	7338	7348
South Atlantic, LLC (Southern Grounding)	Z588	Z348
Wilcor	WA8580G	WA8340G

Electro-Galvanized Steel

Apache	G588	G348
	G588PT**	G348PT**
Blackburn	GR6258	-
Calpico	G8580	-
LMP	6258E**	7508E**

Stainless Steel

Galvan	S6258	S7508
Teledyne (MEFCO)	TDY Sol	TDY Sol
Wilcor	WA 588-S	WA348-S

\*Rod furnished with clamp.

\*\*Rod furnished with 4 ft., No. 6 tinned or galvanized copper pigtail.

ai - Rods, ground, sectional

Galvanized steel and  
copper-covered steel

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods. Rods are copper-covered unless marked galvanized steel.

Sectional Ground Rods

Manufacturer	8' long	10' long	Coupling	Driving studs
Blackburn	6258S13MX	6260S13MX	60C 60CNT2*	60DS 60DSNT*
Demark Galv. Steel	-	-	GRC 58B* GRC 58G*	-
Eritech (Carolina Galv./Knight)			CR-58	
	635883	635803	CC-58*	DSH 58
Galv. Steel	835880	835800	GC 58	DSH 58
Galv. Steel	833480	833400		DSH 34
Galvan	-	-	GRC-58G**	-
	-	-	GRC-34G**	-
Galv. Steel	G25G13S	6260G13S	60-C	60-DS
	-	-	60-TC**	-
Hubbell (Chance) Galv. Steel	C203-0052	8512	8611	-
Joslyn	-	-	J9182	J9186
Galv. Steel	-	-	J23282A	-
South Atlantic, LLC (Southern Grounding)	CS58813	CS581013	-	-
	CS34813	CS341013	-	-

\*Threadless coupling or drive head

ao - Bolt, strand eye, straight (thimble eye)

Applicable Specification: ANSI C135.4, "Standards for  
Galvanized Ferrous Eye Bolts and  
Nuts for Overhead Line  
Construction."

Applicable Sizes: 5/8 inch, 6 through 12 inch length 3/4  
inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specification:

Dixie Electrical Manufacturing Company  
Hubbell (Chance)  
Joslyn Manufacturing Company  
Kortick Manufacturing Company  
MacLean (Continental)

\*"Static proof" designs available.

ap - Clamp, hot line  
Copper and Copperweld-copper Conductor  
(Clamps with internal springs and enclosed threads)

Conductor	
Copper	6 thru 2/0
Copperweld-copper	8A thru 2A
Blackburn	HLC 2108
Hubbell (Anderson)	BC-2/0
Hubbell (Chance)	S1520CC
Hubbell (Fargo)	GH-100S
	GH-201 (For use with CL Fuse)
Ideal	3532
MacLean (Reliable)	C1520
Penn-Union	HLC-020-LS

ap - Clamp, hot line  
ACSR with armor rods

Clamps listed below have spring action and enclosed thread chambers.

Conductor Size		4/0 & 3/0	2/0	1/0 & 2	4
	Tap Conductor				
Connector Mfg.	Aluminum	HL 4/0	-	-	-
Hubbell (Anderson)	Aluminum Copper	AC-800 AC-800-GP	AH-4 AH-4-GP	AH-4 AH-4-GP	AH-4 AH-4-GP
Hubbell (Chance)	Aluminum Copper	S1540-AA S1540-AC	S1540-AA S1540-AC	S1530-AA S1530-AC	S1530-AA S1530-AC
Hubbell (Fargo)	Aluminum Copper	GH-202AL GH-102AC	GH-202AL GH-102AC	GH-101A GH-101AC	GH-101A GH-101AC
MacLean (Reliable)	Aluminum Copper	-	-	C1530A C1530A	C1530A C1530A
Penn Union	Aluminum Copper	- -	- -	HLCA-040 HLCA-040	HLCA-040 HLCA-040
Utilco	Aluminum	-	HLC-397	-	HLC-40

ar - Wireholder

Applicable Specification: "RUS Specification for Service Wireholders," D-15

	<u>With #22 Wood Screw</u>
Blackburn	SW3
Dixie	D3-11-44
Hubbell (Chance)	3-11-44
Porcelain Products	1986

NOTE: For triplex type service cable see clevis type wireholders on page bt-1.

Conditional List  
ar(1)  
July 2002

ar - Wireholder  
(with #22 wood screw)

Manufacturer	Conditions
<u>Joslyn</u> J089Z (nylon alloy)	To obtain experience.
<u>Hubbell Power Systems (Chance)</u> C207-0138 (nylon alloy)	To obtain experience.



as - Clevis, service swinging

Applicable Specifications: "RUS Specifications for Service Swinging Clevises," D-7

	<u>Clevis Only*</u>	<u>Clevis with Wet Process Spool</u>	<u>Clevis with Dry Process Spool</u>
Dixie	D1938	D1938-C	D1948-C
Hubbell (Chance)	1948C	1948C-C909-1031	1948C-0606
Joslyn	J1614	-	-
Kortick	K9260	K9141	K9142
MacLean (Continental)	U32003	U31003	U31004

\*Catalog number does not include spool; for spool insulators see Item cm.

at-1  
January 2003

at - Guy Marker, 8 Foot Length

Steel

<u>Manufacturer</u>	<u>Full Round</u>	<u>Half Round</u>
Joslyn	J1618	J1528
Kortick	K3729	-

aw - Washer, Spring

1/4" x 1-3/4" x 3-1/2"

Manufacturer	Bolt Size		
	5/8"	3/4"	7/8"
Hubbell (Chance)	3540	3541	--
Joslyn	J3540	J3541	J3542
Kortick	K2909	--	--
Line Hardware	SCW-58	SCW-34	SCW-78

## ax - Cutout and Arrester, Combination

Nominal System Voltage		<u>For 12.5Y/7.2 kV</u>		<u>For 13.2Y/7.6 kV</u>		<u>For 24.9Y/14.4 kV</u>	
Cutout Max. Voltage Rating		<u>7.8 kV</u>		<u>15 kV</u>	<u>15 kV</u>	<u>18 kV</u>	<u>27 kV</u>
Application		1ø Trans.	1ø Sect.	3ø Bank 3ø Sect.	1ø Trans.	1ø Trans.	3ø Bank 3ø Sect.
Cutout Current Rating		<u>50*</u>	<u>100</u>	<u>100</u>	<u>50*</u>	<u>100</u>	<u>50*</u>
Manufacturer	Type Mounting	Catalog Numbers					
ABB	Crossarm Crossarm (L)		7.8 NCX/9 LVG 7.8 LBU-II/9 LVG	15 NCX/10 LVG 15 LBU-II/10 LVG		15 NCX/10 LVG 15 LBU-II/10 LVG	24.9 NCX/18 LVG 24.9 LBU-II/18 LVG
Cooper	Crossarm (L) Transformer Crossarm	AFZS110M010	AFZS510B Series L4A1P1A00-BDOA	AFZS510C Series L4A1P1A00-BDOA	AFZS110M010	AFZS510C Series L4A1P1A00-BDOA	AFZS518D Series L9CAP1A00-BGOA
Hubbell (Chance)	Crossarm Transformer		C7 Series	C7 Series		C7 Series	C7 Series
Kearney/Cooper Power Systems	Crossarm Transformer			KE3AB110E-110		KE4AB110E-110	KE7BD109E-110
		294072			294073		294074

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

\*These cutouts have open links and must not be used where fault currents are high or for sectionalizing.

(L) Indicates loadbreak type is available.

az - Pole Numbers and Letters, Metal

(See Drawing M52-3)

Manufacturer	Catalog No.
Almetek Industries, Inc.	"E-Z Tags" - Order by description
Premax Products	1523
Tech Products	Everlast Tag

ba - Bolt, Angle Eye

Thimble Type

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch, 6 through 12 inch length  
3/4 inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specifications:

Dixie Electrical Manufacturing Company  
Hubbell (Chance)  
Joslyn Mfg. and Supply Company  
Kortick Manufacturing Company  
MacLean (Continental)

\*"Static proof" designs available.

be - Recloser, vacuum interruption with solid dielectric

Manufacturer	Conditions
<u>ABB</u> Three phase, Type VR-3S electronically controlled, vacuum interruption, solid dielectric, 560 amps maximum continuous, 12000 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV.	To obtain experience
<u>Cooper Power Systems</u> Three phase, Type NOVA electronically controlled, vacuum interruption, solid dielectric, 560 amps maximum continuous, 12000 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV.	To obtain experience
Single Phase, Type NOVA electronically controlled, vacuum interruption, solid dielectric, 400 amps maximum continuous, 8000 amps RMS symmetrical interruption, or 800 amps maximum continuous, 12500 amps RMS symmetrical interruption 15.5 kV maximum for 12.5/7.2 kV, 29.2 kV maximum for 24.9/14.4 kV.	To obtain experience
Three phase, Type NOVA-TS Triple-Single electronically controlled, vacuum interruption, solid dielectric, 400 amps maximum continuous, 12500 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 29.2 kV maximum for 24.9/14.4 kV.	To obtain experience
<u>Joslyn Hi-Voltage</u> Three-phase, Type TRIMOD 300 series, vacuum interruption, solid dielectric foam, 560 amps maximum continuous, 12000 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV	To obtain experience
Single-phase, Type TRIMOD 100 series, vacuum interruption, solid dielectric foam, 560 amps maximum continuous, 12500 amps RMS symmetrical interruption, 17.1 kV maximum for 12.5/7.2 kV, 29.3 kV maximum for 24.9/14.4 kV	To obtain experience

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.

2. Reclosers are not acceptable with load current, bushing CT battery chargers.

bh - Clevis, Service Deadend

Applicable Specification: "RUS Specification for Service Deadend Clevises," D-8

Manufacturer	Clevis Only*	Clevis with dry process spool	Clevis with wet process spool
Dixie	D0341	D0341-D	D0341-W
Hubbell (Chance)	0341	0341-0606	0341-C909-1931
Joslyn	J0313	-	-
Kortick	K9250	K9100	K9099
MacLean (Continental)	U32136	U31136	U36136

\*Catalog number does not include spool; for spool see Page cm.



bk - Guy Plate

Applicable Specifications:

Strain Type: Edison Electric Institute Specification TD-11 1951, "Specifications for Guy Hooks and Guy Strain Plates."

Lift Type: None

	Strain Type 4" x 8" x 14 gage	Lift Type 2-1/2" x 7" x 1/4", 2 hole
Dixie	D6575	D7888
Hubbell (Chance)	6575	7898
Joslyn	J1034	-
Kortick	K4015	K3511
Line Hardware	GSP-1	-
MacLean (Continental)	U5351	UC434

bn-1  
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bn - clamp, loop deadend

For ACSR

	3/0	2/0	1/0	2	4
ALCOA	-	413	413	412	411
Blackburn	DLC23	DLC2106	DLC2106	DLC2106	DLC2106
Burndy	-	-	UW25R	UW2R	UW2R
C & R	-	-	CRLD-10	CRLD-10	CRLD-10
Hubbell (Anderson)	LC-74B	LC-71B	LC-70B1	LC-70B	LC-70B
Hubbell (Fargo)	GA-145	GA-145	GA-144	GA-144	GA-144
MacLean (Bethea)	ALD-7373-U	ALD-34-U	ALD-1313-U	ALD-1313-U	ALD-1313-U

bo - Shackle, anchor

Distribution

20,000 lbs.  
5/8" Pin

Dixie	D5801
Hubbell (Anderson)	AS-25
Hubbell (Chance)	5801
Joslyn	J2742
Kortick	K4481
Lapp	33852
Lindsey	3260
Line Hardware	AS-1
MacLean (Bethea)	ASH-45
Sur-Loc, Inc.	5500

Transmission

	<u>30,000 lbs.</u> <u>3/4" bolt</u>	<u>50,000 lbs.</u> <u>7/8" bolt</u>
--	--	--

Joslyn	BT3023BNK	BT3036BNK
MacLean (Bethea)	ASH-56-BC	ASH-67-BC

br-1  
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br - Chain Link (End Link)

<u>Manufacturer</u>	<u>Catalog Number</u>
Joslyn	BT-3082
Lapp	6415-HT
Lindsey	3403
MacLean (Bethea)	CL-5

bs - Bolt, single upset

Applicable Specifications: "RUS Specifications for Single and Double Upset Spool Bolts," D-5

Diameter, inches	5/8	5/8	5/8	5/8
Length, inches	7	8	9	10
Dixie	D7740	D7741	D7741-1/2	D7742
Hubbell (Chance)	-	7741	7741-1/2	7742
Joslyn	-	J2342-1/2	J2343-1/2	J2344-1/2
Kortick	K4929	K4950	K4930	K4951
MacLean (Continental)	U3105-1/2	U31053	U31053A	U31054

\*"Static proof" designs available.

bt-1  
January 2003

bt - Wireholder, clevis type  
with No. 24 wood screw

(For use with triplex type service cable, Drawing K10C-A)

Dixie	D075*
Hubbell (Chance)	0192*
Joslyn	J075*

\*Catalog number does not include insulator. Use secondary type spool insulator with 1-3/4 inch groove diameter. See page cm-1.

cg - Switch, air, three-pole, group operated

(not Suitable for Substation Use)

<u>Manufacturer</u>	<u>Acceptable Mounting</u>	<u>Vertical Break</u>		<u>Side Break</u>		<u>Center Break</u>	
		Type	kV	Type	kV	Type	kV
Hubbell (Chance)	Horizontal			D6(L)	15-34.5		
	Phase over Phase			D6(L)	15-34.5		
	Vertical	D7(L)	15-34.5				
Cooper Power Systems (Kearney)	Horizontal			M-FORCE(L)	15-35		
	Phase over Phase			M-FORCE(L)	15-35		
	Vertical			M-FORCE(L)	15-35		
Royal Switchgear	Horizontal					V	15-23
	Phase over Phase					V	15-23

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, three-pole, group-operated  
(Factory Preassembled)

Manufacturer	Acceptable Mounting on Structures	Vertical Break Type	kV	Side Break Type	kV
ABB	Horizontal (A)			SLB-3(L)	15-25
Bridges Electric <sup>#</sup>	Horizontal (A)			Vector(L)	15
	Phase over phase (A)			Vector(L)	15
	Vertical (A)			Vector(L)	15
<sup>#</sup> Only operating shaft version of switch accepted.					
Hubbell (Chance)	Horizontal (A)			D7(L)	15-27
	Phase over phase (A)			D7(L)	15-27
	Vertical (A)			D7(L)	15-27
	Horizontal (B)			D7(L)	34.5
	Phase over phase (B)			D7(L)	34.5
	Vertical (B)			D7(L)	34.5
Cooper Power Systems (Kearney)	Horizontal (A)			M-FORCE	15-35
	Phase over phase (A)			M-FORCE	15-35
	Vertical (A)			M-FORCE	15-35
Inertia Engineering	Horizontal (A)			LBS(L)	15-35
	Vertical (A)			LBS(L)	15-35
	Phase over phase (A)			LBS(L)	15-35
S&C*	Horizontal (A)			Alduti(L)	15-25
				Alduti(L)	34.5
				(200 kV BIL)	
	Phase over phase (A)			Alduti(L)	25
				Alduti(L)	34.5
				(200 kV BIL)	
	Vertical (A)			Alduti(L)	15-25
				Alduti(L)	34.5
				(200 kV BIL)	
	Phase over phase (B)	Alduti(L)	34.5	Alduti(L)	34.5
	Vertical (B)	Alduti(L)	34.5		

(L) Means gas or solid material full-load interrupters are accepted and available.

(A) Not suitable for substation use.

(B) For station and transmission use only. The steel crossarm base must be grounded with an adequate grounding connector. 200 kV BIL only.

NOTE: Switches with factory-assembled crossarm type bases for distribution lines must have non-conducting crossarm type bases, non-conducting braces, and insulated interphase and control rods, except as otherwise noted.

\* Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.



cj - Pole Ground Wire

Soft annealed iron, BB Grade, class C galvanizing  
(For pole protection only)

Size  
1.15 Ohms/1000 ft., max.

Manufacturer

Florida Wire and Cable	3-wire, 5/16 inch
Indiana Steel and Wire	3-wire, 5/16 inch
National Strand Products	3-wire, 5/16 inch
Southwire	3-wire, 5/16 inch

Copper, soft annealed solid  
ASTM Specification B3

Manufacturer  
(See page av-2)

Aluminum (for above ground use only)  
Hard-drawn

Manufacturer  
(See page av-1)

Aluminum Alloy (for above ground use only)

<u>Manufacturer</u>	<u>Type</u>
Alcan Cable	6201
American Electrical	6201
Southwire	6201

Copper-Clad Steel, Annealed 40 percent Conductivity

<u>Manufacturer</u>	<u>Size</u>
Copperweld Southern*	No. 6

\* Not for use on distribution when neutral is larger than #1/0 ACSR.

ck - clamp, anchor rod bonding

For Standard and Drive Type Rods

Diam. of Rod	Type of Eye	5/8"	3/4"	1"
C & R Products	Single	CRBC-1	CRBC-1	CRBC-1
	Twin	CRBC-2	CRBC-2	CRBC-2
	Triple	-	CRBC-3	CRBC-3
Dixie	Single	D3143	D3143	D3143
	Twin	-	D3144	D3144
	Triple	-	D3145	D3145
Hubbell (Chance)	Single	G5060	G5060	G5060
	Twin	G5061	G5061	G5061
	Triple	-	G5063	G5063
Joslyn	Single	3230	3230	3230
	Twin	3231	3231	3231
	Triple	-	3233	3233
Kortick	Single	K3147	K3147	-
	Twin	-	K3148	K3148
	Triple	-	K3149	K3149
Line Hardware	Single	RBC-100	RBC-100	RBC-100
	Twin	RBC-200	RBC-200	RBC-200
	Triple		RBC-300	RBC-300
MacLean (Continental)	Single	UCG5060	UCG5060	-
	Twin	-	UCG5061	UCG5061
	Triple	-	UCG5063	UCG5063

For Power Installed Screw Anchors

C & R Products	Single	CRBC-4	CRBC-5	-
Hubbell (Chance)	Single	G5067	G5068	-
Joslyn	Single	J26714	J26715	-
Line Hardware	Single	RBC-400	RBC-500	-

cs - Bracket, Pole Top Pin

For Transmission and 24.9/14.4 kV Distribution

Applicable Specifications: "RUS Specifications for Pole Top Brackets for Channel Type Pins," D-14

Hubbell (Chance)	2157
Kortick	K8130
MacLean (Continental)	U36690

ct-1  
July 2002

ct - Plate, Double Arming

Transmission

Manufacturer	4" x 1/2" x 24"	4" x 1/4" x 17"
Dixie	D5844	D5845
Hubbell (Chance)	5844	5819
Joslyn	J1600	-
Kortick	K1454	K1465
Line Hardware	-	DAP-17
MacLean (Continental)	U4117	-

da - Bracket, insulated

	Bracket without Insulator	Bracket with 1-3/4" Spool Insulator	Bracket with 3" Spool Insulator
Dixie	D0327	-	-
Hubbell (Chance)	0327	0327-C909-1032	0327-C909-1304
Hughes Brothers	1077LI	1077SI	1077I
Joslyn	J1300	-	-
Kortick	K9278	K9081	K9082

dh-1  
July 2002

dh - Ground, pole

(For system grounds, see ground rods on page ai.)

Manufacturer

Catalog Number

Galvanized Steel Plate With Insulated Copper Lead

(For connecting to a copper or aluminum ground wire above  
ground.)

Line Hardware

PGPS-56CL8

Galvanized Steel Plate with Connector

(For connecting to a galvanized iron ground wire)

Line Hardware

PGPS-56C

Copper Plate

Blackburn

GP-100

Drabco

D 101

Eritech

EGP-100

Homac

5575

Joslyn

J9196

Line Hardware

PGPC-56

dl - Pipe Spacer

3/4" diameter x 1-1/2" length

<u>Manufacturer</u>	<u>Catalog Number</u>
Dixie	D2031
Hubbell (Chance)	2237
Joslyn	J2031
MacLean (Continental)	U36695

dm - Bracket, transformer  
(For cluster mounting of two or three transformers on pole)

Manufacturer	Transformer Size, kVA	Band Type	Through Bolt Type
Aluma-Form	3-50 75-100	6M3-6 15M3-6	3MW-24-M 11MW-24
Barfield Manufacturing Co.	3-50 75-100	BMAC-366 BMAC-3156	- -
Dixie	3-25 37-1/2-50 75-100	- - -	DW-50 DW-50 DW-167
Hubbell (Chance)	3-50 75-100	C6M3-6 C15M3-6	- -
Hughs	3-25 37-1/2-50 75-100	- - -	3021 3020 3020 with adapter plates and back plate
Joslyn	3-25 37-1/2-50 75-100	- - -	J6865 J6864 J6866
Turner	3-25 37-1/2-50 75-100	- - -	305-25 305-100 305-100

For mounting of two transformers

Aluma-Form	3-100 3-50	- -	DM-4M2 DM-2M2
Hubbell (Chance)	3-100	-	C212-0001
Hughes	3-50	-	3022
Turner	3-50	-	205-25



dr - Clevis, conduit, insulated

For use in deadending triplex service cable, Drawing K16C.

Applicable Specifications: "RUS Specifications for Insulated Conduit Clevises and Conduit Wire-holders for  
Pipe Mast Deadends," D-16

Joslyn

J0311\*

\*Insulator not included. See page cm for spool insulator.

ds-1  
January 2003

ds - Wireholder, conduit

For use in deadending open wire services on pipe masts, Drawing K17

Applicable Specifications: "RUS Specifications for Insulated Conduit Clevises and Conduit Wireholders,"  
D-16

<u>Manufacturer</u>	<u>Catalog Number</u>
Dixie	D-4010
Hubbell (Chance)	C207-0075

dy - Bolt, eye, double arming

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch, 14 through 26 inch length  
3/4 inch, 14 through 26 inch length

The following manufacturers have shown compliance with the applicable specifications:

Dixie Electrical Manufacturing Company  
Hubbell (Chance)  
Joslyn Manufacturing Company  
Kortick Manufacturing Company  
MacLean (Continental)

dz-1  
January 2003

dz - Clip, Guy Wire

Manufacturer	5/16"	3/8"	7/16"	1/2"
Hubbell (Chance)	6453	6454	6455	6456
MacLean (Continental)	U4953	U4954	U4955	U4956

ea - Insulator, post type

<u>Manufacturer</u>	<u>Conditions</u>
<u>Victor Insulators, Inc.</u> 2120 (12.5/7.2 kV) 2127 (24.9/14.4 kV) 62055 (22 kV) 62056 (34.5 kV)	To obtain experience.

eb - Bracket, Pole Top  
For Post type Insulators

DISTRIBUTION

Hubbell (Anderson) (14.4 or 7.2 kV)	84324-2000
Hubbell (Chance) (14.4 or 7.2 kV)	1B4
Joslyn (Flagg) (14.4 or 7.2 kV)	P526
Lapp (Line Ware) (14.4 or 7.2 kV)	304043
Line Hardware (14.4 or 7.2 kV)	PTIB-375A
MacLean (Continental) (14.4 or 7.2 kV)	PTB-55-8
Universal Electric (14.4 or 7.2 kV)	PT-8R

TRANSMISSION

Hubbell (Chance)	1B4
Joslyn (Flagg)	P532
Lapp (Line Ware)	304044
MacLean (Continental)	PTB-66H

ec - Bracket, Offset Neutral

Dixie	D-2353
Hubbell (Chance)	C206-0004
Joslyn	J2352

ed - Support, overhead ground wire

Applicable Specifications: "RUS Specifications for Overhead Ground Wire Support Brackets," T-2

Pole top diameter, inches	6-8	8-10	10-12
Dixie	-	-	D7760
Hubbell (Chance)	-	5432	5432
Hughes Brothers	-	2859-12	2859-14
Joslyn	-	J6394	J6395
Kortick	K3580	K3581	K3582
MacLean (Continental)	UC1238	UC1239	UC1240



ej - Clamps, deadend with socket eye

ACSR

	AWG	kcmil					
	2/0 to 4/0	266.8	336.4	477	556.5	795	954
		<u>Iron or Steel Clamps (requires armor tape or liner)</u>					
Hubbell (Anderson)	-	80445-2000	80445-2000	-	-	-	-

Aluminum Alloy Clamps (do not require armor tape or liner)

Anderson/Hubbell	SD-57-S	SD-70-S	SD-70-S	SD-86-S	SD-86S	--	--
C & R	CR-10-60S	CR-20-60S	CR-20-60S	--	--	--	--
Lapp	305757S	305758S	305759S	305760S	--	--	--
MacLean (Bethea)	ADE-21-S	ADE-22-S	ADE-23-S	ADE-24-S	ADE-24-S	ADE-2526-S	ADE-2526-S

NOTE: When used with clevis-type insulators for large conductors on distribution lines, order clamp with clevis eye.

ek - Locknuts

For Bolt Diam., in.:	<u>MF Type</u>				
	<u>3/8</u>	<u>1/2</u>	<u>5/8</u>	<u>3/4</u>	<u>7/8</u>
Dixie	D3510	D3511	D3512	D3513	--
Hubbell (Chance)	3510	3511	3512	3513	3514
Hughes Brothers	MF30	MF50	MF60	MF70	--
Joslyn	J8581	J8582	J8583	J8584	J8584-1/2
Kortick	K1065	K1066	K1067	K1068	--
Line Hardware	SLN38	SLN50	SLN58	SLN34	SLN78
MacLean (Continental)	U4920	U4921	U4922	U4923	U4924

em - Brace, crossarm, special  
(angle alley arm)

DISTRIBUTION

15" span, 14" drop; 1-1/2" x 3/16"

Dixie	D17939
Kortick	K1978
MacLean (Continental)	U5514

TRANSMISSION

2'-6" span x 1'-8" drop 3'-6" span x 2'-3" drop

	<u>1-3/4" x 3/16"</u>	<u>1-3/4" x 3/16"</u>
Hubbell (Chance)	-	6999
Hughes Brothers	AS-2309-B	AS-2309-A
Kortick	K1975	K1976
MacLean (Continental)	U5509	U5510

eq - Narrow Profile Brackets and Special Arm Assemblies

METAL BRACKETS

Manufacturer	Conditions
<u>Dixie</u> Deadend bracket assembly D21142 for 12.5/7.2 kV Deadend bracket assembly D21144 for 24.9/14.4 kV	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected.
<u>Hubbell (Anderson)</u> Standoff bracket, COB-E-180-TGL	Same as above.
<u>Hubbell (Chance)</u> Single post insulator brackets C206-0209 for 12.5/7.2 kV construction only C206-0010 for 24.9/14.4 kV construction Deadend bracket assembly, C206-0179 Deadend bracket assembly, C206-0211 for 24.9/14.4 kV construction	Same as above.
<u>Joslyn (Flagg)</u> Standoff bracket, PA619B	Same as above.
<u>MacLean (Continental)</u> Standoff bracket IACB-18-5	Same as above.

fi - Connectors, hot line

Over Armor Rods

<u>Manufacturer</u>	<u>Catalog Number or Series (Al to Al)</u>	<u>Catalog Number or Series (Al to Cu)</u>
Blackburn	PGH	-
Hubbell (Anderson)	AC Series	AC-GP-Series
Hubbell (Fargo)	GA-100 Series	GA-100C Series

fj - Bracket, extension

(For use in mounting circuit reclosers or sectionalizers)

See Drawing VM3-10A

	Through Bolt Type	Band Type
Aluma-Form	TBRSM-1, TB2M1-9*	RSM-1
Dixie	D-2359-M	
Joslyn	J2357	

\*For mounting double lug reclosers.

fk - Bracket, circuit recloser or sectionalizer

(For cluster mounting of three circuit reclosers on pole)

	Cluster Mount	Rack Mount
Aluma-Form	RSM-3, 6M3-9*	3SPR-66, 3SPR-84
Turner	695-3	

\*Suitable for 14.4 and heavy duty 7.2 kV.

fl - Rack, primary metering

(For cluster mounting of primary metering equipment on pole)

Aluma-Form	PMM Series
Barfield Manufacturing Co.	BAPMM6
Turner	3CT-PT

fm - Extension Bracket for Mounting Apparatus  
(Arrester, Cutouts and Potheads for Distribution Pole Mounting)

Manufacturer	Application Voltage	Single Phase	Three Phase
Aluma-Form	12.5/7.2 kV	1HCA-18 Series	R3CA-48
		1HCA-C-18	
	24.9/14.4 kV	WBMA-1	R3CSA-48
Barfield Mfg. Co.	12.5/7.2 kV	BAC 1256	
	24.9/14.4 kV	BAC 1710	
	12.5/7.2 kV	BACA 126 (double mounting)	
	24.9/14.4 kV	BACA 1710 (double mounting)	
Dixie	12.5/7.2 kV	D-1580	D27211-G
	24.9/14.4 kV	D-1583	-
Hubbell (Anderson)	12.5/7.2 kV	COB-E-120-TGL	-
	24.9/14.4 kV	ACOB-E-180	-
		COB-E-180-TGL	-
Hubbell (Chance)	24.9/14.4 kV	C653-1038	C653-1056
Hughes Brothers	12.5/7.2 kV	892-18	670-40
	24.9/14.4 kV		
Joslyn (Flagg)	12.5/7.2 kV	PA613B	7510-730
	24.9/14.4 kV	PA619B	7510-740-17
Line Hardware	12.5/7.2 kV	CA-12-3GL	-
MacLean (Bethea)	12.5/7.2 kV	VIB3-18-R1-GC-C	
		VIB3-12F-GC	
	24.9/14.4	VIB3-18-GC	
MacLean (Continental)	12.5/7.2 kV	IACB-12-5LGE	GPB-3-0-568M-3012-CAT 12
	24.9/14.4	IACB-18-5LGE	GPB-3-0-568M-4017-CAT 12
Modern Aluminum	12.5/7.2 kV	V183-12	
Universal Electric	24.9/14.4 kV	SAB-3-18-GC	

Note: Above brackets are not suitable for supporting nor deadending distribution line conductors. (See items "eq" for narrow profile bracket and special arm assemblies.)

fn - Extension Bracket for Mounting Cutouts

Refer to item fm.

fo-1  
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fo - Bracket, Transformer Secondary, Insulated

Manufacturer Insulator	Bracket Without Insulator	Bracket With 2-1/4" Diameter Spool Insulator	Bracket With 3-1/8" Diameter Spool
Hubbell (Chance)	-	9113S	9114S
Joslyn	-	J6765-A	J6765
Maclean (Continental)	U865	U865/208	U865/205



gj - Crossarm Assemblies

Braceless

Manufacturer	Conditions
<u>Aluma-Form</u> HD-DEA-86-EB-REA HD-2-DEA-86-EB-REA HD-DEA-108-EB-REA HD-2-DEA-108-EB-REA	To obtain experience.
<u>Geotek (PUI)</u> DA2500-96 DA2500-120 DA3000-96 DA3000-120	To obtain experience.
<u>Hughes Brothers</u> 3377-A7.5 3377-A8.5 3377-A9.5	To obtain experience.
<u>MacLean Power Systems</u> PZ08LD PZ10LD PY08SD PY10SD	To obtain experience.
<u>Shakespeare</u> IDB096N1224(X)RUS** XDB096N1224(X)RUS** HDB096N1224(X)RUS** IDB120N1224(X)RUS** XDB120N1224(X)RUS** (**X=2-Gray Color 5-Dark Bronze Color)	To obtain experience

gw-1  
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gw - Crossarm Assembly for H-Frame Construction

Applicable Specification: RUS Specification T-7, Revision dated November 1962  
Applicable Drawing: TH-11B Series (161 kV maximum)  
No braces (TH-11B)  
Two vee braces on outside (TH-11BVO)  
Two vee braces on inside (TH-11BVI)  
Four vee braces (TH-11BV4)

3-5/8" x 9-3/8" x 33' wood crossarm assembly complete with  
attaching hardware, fittings, bolts and 3-3/8" x 5-3/8" braces.

Catalog Nos. or Drawing Nos.

	TH-11B	TH-11BVO	TH-11BVI	TH-11BV4
	<u>Items</u>	<u>Items</u>	<u>Items</u>	<u>Items</u>
(Assemblies)	gw	gw and vo	gw and vi	gw and vv
Brooks (1,2)	6411	6411-1	6411-2	6411-3
Hughes Bros.(1,2)	C3316-B	C3316-B	C3316-B	C3316-B
Pennington (1,2)	CCC11B72	CCC11B72-VO	CCC11B72-VI	CCC11B72-V4

- 1 - Fixed spacer fitting sizes as required  
2 - Adjustable spacers are available

U gc - Shield, cable riser

Manufacturer	Dia. (Inches)	Length (Feet)
<u>Galvanized Steel</u>		
Electrical Materials	2 - 3 - 4 - 5*	5*
Hubbell (Chance)	2 - 3 - 3 1/2	5 - 9
Joslyn	2 - 3 - 3 1/2*	5 - 8*
Midland-Ross (Kindorf Snapduct)	2 1/2 - 3 1/2 - 5 (14 ga. galv. steel)	2 1/2 - 5 - 10
<u>Plastic and Fiberglass</u>		
Carlton	2 - 3 - 4 - 5 - 6*	10*
Custom Plastics	2 - 3 - 4 - 5*	5 - 10*
Electrical Materials (plastic)	1 - 2 - 3 - 4 - 5 - 6*	5 - 8 - 10*
Applied Extrusion Technologies (plastic) (Power Mold, I, II, III)	2 - 3 - 4 - 5 - 6*	5 - 8 - 10*
Joslyn (plastic)	2*	10*
Nordic (fiberglass)	2 - 3 - 5*	5 - 10*

(Order by size and length)

\*All sizes available with back plate.

Full Round\*\*

Smith Fiberglass Products (standard wall)	2 - 3 - 4 - 5	30
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\*\*Full round riser shield is to be mounted directly to the surface of the pole with no standoffs.

U gk-1  
July 2002

U gk - Terminations, Indoor

(When ordering specify conductor size, type, whether  
copper or aluminum and insulation diameter.)

Manufacturer	Catalog No.
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PREMOLDED

Cooper Power Systems	Fasterm Stress Cone (15 & 25 kV)
Elastimold (ESNA)	Style 35-MS C (15, 25 & 35 kV)
Hubbell (Chardon)	Termi-Matic, Type A or G (15, 25 & 35 kV)

HEAT SHRINK

G&W	ESTS15_PLA (15 kV) ESTS25_PLA (25 kV)
Hellermann	MVTS15_PLA (15 kV) MVTS25_PLA (25 kV)
Tyco (Raychem)	HVT (15, 25 & 35 kV)

COLD SHRINK

3M	QT III Series (15 kV) Quick Term II Series (25 & 35 kV)
Joslyn	JIPT Series (15, 25 kV) JPT Series (25 kV)
Tyco (Raychem)	TFT Series (15, 25, 35 kV)

INSULATED WRAP

Plymouth/Bishop	Stress-Wrap (15, 25 & 35 kV)
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## U hf - Jacketed Cable Grounding Kits

(For connecting a grounding lead wire to the concentric neutral wires and resealing the jacket.)

(When ordering, specify diameter of cable over jacket.)

Manufacturer	Conditions
<u>3M</u> Model 2252 Cable Grounding Kit	To obtain experience.
<u>CANUSA-EMI</u> Model CFGK-REA Cable Grounding Kit	To obtain experience.
<u>Raychem</u> Model JGK Cable Grounding Kit	To obtain experience.

U hj-1  
January 2003

U hj - Bracket, combination arrester, cutout and pothead mounting

Applicable Drawing: UM2, UM2A, UM2-4

Manufacturer	Single Phase	Three-Phase
Aluma-Form	1HCA-18-1PB Series	---

U hv - Cable, Underground  
15 kV and 25 kV Cable

(Alternative Insulation Compound)

Applicable Specification:	RUS Specification U-1
Conductor (15 kV):	Copper or Aluminum - #2 AWG through 1000 kcmil
Conductor (25 kV):	Copper or Aluminum - #1 AWG through 1000 kcmil
Insulation:	Tree-retardant Crosslinked Polyethylene (XLP-TR) (I) indicates Pirelli IE.7100 XLP-TR (II) indicates AT Plastic PowerGuard 320TR (III) indicates Union Carbide HFDB-4202 (IV) indicates Nova Borealis LE 4212
Neutral:	Copper Concentric Neutral
Jacket:	High Molecular Weight Polyethylene
Conditions:	To obtain experience

Manufacturer	Insulation(s)	Flat Strap Neutral Available
General Cable	XLP-TR (II, III, IV)	Yes
Hendrix	XLP-TR (III, IV)	No
Nexans Canada	XLP-TR (II, III)	No
Pirelli	XLP-TR (I, IV)	Yes
Southwire	XLP-TR (III, IV)	No

Conditional List  
U hv(2)  
July 2002

U hv - Cable, Underground

600 Volt Cable

(Alternative Cable Constructions)

Applicable Specification: RUS Specification U-2 (except as indicated below)

NOTE: Manufacturers listed below are conditionally accepted for alternatives A, B, and/or C for the products listed on pages U hv-3 and U hv-4.

Alternative A: 8000 series aluminum alloy in accordance with ASTM B800 or B801.

Alternative B: Stranding in accordance with ASTM B786 for aluminum 1350 conductors or ASTM B787 for copper conductors.

Alternative C: Abuse resistant (ruggedized) (single or two layer) insulation in accordance with ICEA S-81-570.

Condition: To obtain experience.

<u>Manufacturer</u>	<u>Alternative</u>
Alcan	(C)
BICC	(A) (C)
Pirelli	(A) (C)
Southwire	(A) (B) (C)



U hw - Warning sign

Applicable Specifications: RUS Drawings UM12-1 and UM12-2

Manufacturer	Size (inches)	Danger Sign Catalog No.	Caution Sign Catalog No.
Brady*	7 x 10	46133	46043
	10 x 14	46131	46041
Eastern Metal*	7 x 10	REA 12-1-710	REA 12-2-710
	10 x 14	REA 12-1-1014	REA 12-2-1014
	14 x 20	REA 12-1-1420	REA 12-2-1420
	20 x 28	REA 12-1-2028	REA 12-2-2028
Electromark*	7 x 10	REA-1-7x10-SV	REA-2-7x10-SV
	7 x 10	REA-1-7x10-AC	REA-2-7x10-AC
	10 x 14	REA-1-10x14-SV	REA-2-10x14-SV
	10 x 14	REA-1-10x14-AC	REA-2-10x14-AC
	14 x 20	REA-1-14x20-SV	REA-2-14x20-SV
	14 x 20	REA-1-14x20-AC	REA-2-14x20-AC
	20 x 28	REA-1-20x28-SV	REA-2-20x28-SV
	20 x 28	REA-1-20x28-AC	REA-2-20x28-AC
Lem	7 x 10	LSS-1400	LSS-1500
	10 x 14	LSS-1401	LSS-1501
	14 x 20	LSS-1402	LSS-1502
Lyle*	7 x 10	UM12-1-710	UM12-2-710
	10 x 14	UM12-1-1014	UM12-2-1014
	14 x 20	UM12-1-1420	UM12-2-1420
	20 x 28	UM12-1-2028	UM12-2-2028
May Advertising	7 x 10	MY710C	MY710B
	10 x 14	MY1014C	MY1014B
	14 x 20	MY1420C	MY1420B
	20 x 28	MY2028C	MY2028B
For pressure sensitive decal add "D" prefix			
Truck Sign Service*	7 x 10	TSD-710	TSC-710
	10 x 14	TSD-1014	TSC-1014
	14 x 20	TSD-1420	TSC-1420
	20 x 28	TSD-2028	TSC-2028

\*Reflective signs also available.

The signs listed on this page are to be secured to equipment and transformer enclosures by means of an adhesive or by welding. Screws and rivets are not to be used.

U hx - Cable Route Marker

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Surface Mounted</u>	
Hubbell (Chance)	C554-0001
<u>Above Grade</u>	
W. H. Brady	BL1 (Decal on one side) BL2 (Decal on both sides)
Carsonite	REA-100
Electromark	REA-3-4x7-SV REA-3-4x7-AC REA-3-5x12-SV REA-3-5x12-AC
Flexstake	603, 604, 605, 606
Greenline	FLU-78 (Decal on one side) DSU-78 (Decal on both sides)
Hubbell (Chance)	C554-0183
Lyle	UM12-712
May Advertising (For pressure sensitive decal add "D" prefix to catalog number.)	MY45A, MY712A
Quantum	QM-375
J Miller Industries	JMI-375
Truck Sign Service	BCW-712